Remarks

Claims 1-102 remain pending in the application. Claims 1, 9, 10, 13, 16-18, 22-26, 35-49, 54, 60-65, 72-78, 80, 81, 84, 85, 87, 92, and 95 have been amended herein. No new matter has been added by this amendment.

Claim Rejections – 35 U.S.C. § 112

Claims 13, 16-18, 22-25, 38-46, 61-65, 73-78, 80, 84, 85, and 92-94 were rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13, 16-18, 22-25, 38-46, 61-65, 73-78, 80, 84, 85, and 92-94 have been amended herein and as a result, reconsideration of the rejections is requested.

Claim Rejections – 35 U.S.C. § 102(b) – Lyons

Claim 1, 3, 7-13, 15-19, 22-28, 38-46, 49, 52, 60, 62, 63, 67-69, 81-89, 92, 93, 95, 97, and 98 were rejected under 35 U.S.C. §102(b) as being anticipated by Lyons (U.S. Patent No. 5,616,342). Reconsideration of the rejection of these claims is solicited.

In contrast to Lyons, independent claims 1, 9, 10, 26, 49, 60, 81, 87, and 92 of the present invention are directed to a photodynamic therapy using a combined application of a photosensitizing agent and a particular class of surfactants, namely those surfactants having ionophoric properties. More particularly, the present invention is directed to a photodynamic therapy utilizing ionophoric surfactants which compromise a cell membrane and permit a photosensitizing agent to pass into the cell interior. Upon application of a light source, the photosensitizing agent is activated within the cell interior and results in an internal photodynamic destruction of the cell. Lyons does not teach or suggest the passage of a photosensitizing agent within the cell interior for subsequent activation. To the contrary, and as discussed further herein, Lyons discloses the use of surfactants to form molecular structures (micelles) on the exterior of the photosensitizing compound to improve the solubility of an otherwise poorly soluable photosensitizing compound.

Surface acting agents or "surfactants" include a broad group of chemical agents and compounds that may have different functions. Surfactants may function as wetting agents, i.e., promoters of spreading of liquids on surfaces or of penetration of liquids into materials; detergents; and emulsifying agents i.e., aiding in the dispersion of one phase within another ordinarily immiscible phase. The utility of any surfactant as a wetting agent, detergent or emulsifying agent is an expression of an aggregate of properties, including specific chemical configuration and is inadequately expressed by any one simple measurement such as surface tension lowering. Therefore it is the specific function and utility of a particular surfactant that determines which surfactant is most appropriate to use in a given situation or application. Particular surfactants, such as disclosed in Lyons, may function to alter the exterior structure of a photosensitizing compound. Other surfactants, such as the ionophoric surfactants, may function to alter a cell membrane to increase the membrane permeability.

The present invention claims the combined use of photosensitizers and a specific subgroup of surfactants that are ionophores, that is, they create openings or breaches in cellular and acellular membranes resulting in the "cell membrane no longer functioning as a effective osmotic barrier." As a result, ionophoric surfactants increase the permeability across the cell membrane. The group of ionophoric surfactants includes but is not limited to: polymyxin B, SDS, cetrimide, benzalkonium chloride, and the polyene antifungal agents nystatin and amphotericin.

The mechanism of action in the present invention is that the presence of the openings in the membranes created by the ionophoric surfactants allows for the photosensitizer to diffuse through (or be inducted into) the permeable membrane into the cell interior. Upon illumination by a specific wavelength of light, the photosensitizing agent within the cell interior is photodynamically activated to cause internal cell destruction. The combination of the ionophoric surfactant and photosensitizer augments the effect of the photosensitizer resulting in the ability of this treatment to eradicate a broad spectrum of microorganisms and cancers that cannot be achieved with the photosensitizer or the ionophoric agent alone. Importantly, non-ionophoric surfactants in combination with photosensitizers and light are not effective in the complete eradication of microorganisms and cancers.

A claim is anticipated only if each and every element as set forth in the claim is found in a single prior art reference. Lyons does not disclose a surfactant having ionophoric properties. To the contrary, Lyons discloses a surfactant having micellar properties to enhance solubility of a poorly water-soluble photosensitizing compound. Micelles are subcellular molecular structures formed on the exterior surface of a compound which may facilitate compound solubility. It is known that micelles may change a compound surface potential to alter the compound affinity to other particular agents. The use of surfactants having micellar properties to enhance the aqueous solubility of otherwise slightly soluble organic substances is well known. *See*, Sugioka, p. 100 (reference included with the attached Information Disclosure Statement). Lyons discloses an emulsion suitable for administering a poorly water-soluable photosensitizing compound consisting of a lipid, a poorly water soluable photosensitizing compound, a surfactant and a cosurfactant. Lyons uses surfactants as emulsifying agents to enhance solubility of the drug (col 10 line 21+), in particular sodium cholate is found to be the most efficient solubilizer. Unlike the present invention, Lyons utilizes surfactants having micellar properties to facilitate emulsification of a photosensitizing compound. The present invention is directed to surfactants having ionophoric properties to increase cell membrane permeability and allow the photosensitizer to diffuse into the cells. Subsequent photodynamic activation of the photosensitizing agent within the cell interior results in cell destruction. Importantly, Lyons does not disclose or suggest a method of compromising the cell membrane to allow the photosensitizing agent to diffuse into the cell and subsequent photodynamic activation of the photosensitizing agent within of the cell interior to cause cellular destruction.

In conclusion, Lyons does not disclose a combined use of a photosensitizing agent and a surfactant having ionophoric properties as presently claimed. Reconsideration of this rejection of these claims is respectfully submitted.

Claim Rejections – 35 U.S.C. § 102(b) – Williams

Claim 1, 4-12, 14, 15, 18, 19, 22-28, 34, 37-46, 49, 50, 60, 61, 63, 67-71, 81-92, 95, 96, and 98 were rejected under 35 U.S.C. §102(b) as being anticipated by Williams et al. Reconsideration of the rejection of these claims is solicited.

In contrast to Williams et al, independent claims 1, 9, 10, 26; 49, 60, 81, 87, and 92 of the present invention are directed to a photodynamic therapy using a combined application of a photosensitizing agent and a particular class of surfactants, i.e., those surfactants having ionophoric properties.

Williams discloses the application of photosensitizing agents to treat vascular lesions and tissues. Williams discloses the use of surfactants as wetting agents to "improve the gel properties" of the photosensitizer solution (lines 3-6, Column 6), to allow the photosensitzer to remain in contact with the treatment tissue for a longer period of time. In addition, the surfactants listed are not ionophoric agents and would not work with the present invention. Unlike the present invention, the surfactant use as disclosed by Williams is as a wetting agent not as an ionophoric agent to create openings in the membranes of cells permitting diffusion of the photosensitizer into the cells. The photodynamic therapy of Williams does not result in the passage of photosensitizing agents through the cell membrane and subsequent illumination and internal photodynamic activation of the agents resulting in cell destruction.

In conclusion, Williams et al does not disclose a combined use of a photosensitizing agent and a surfactant having ionophoric properties as presently claimed. Reconsideration of the rejections of these claims is respectfully submitted.

Claim Rejections – 35 U.S.C. § 102(b) – Nitzan

Claim 1-3, 6, 8, 10-13, 15, 18, 26, 30, 32, 37, 39, 44, 45, 48, 49, 51, 52, 80-83, 86, 87, 92, 95, and 97 were rejected under 35 U.S.C. §102(b) as being anticipated by Nitzan. Reconsideration of the rejection of these claims is solicited.

In contrast to Nitzan et al, independent claims 1, 10, 26, 49, 81, 87, and 92 of the present invention are directed to a photodynamic therapy using a combined application of a photosensitizing agent and a particular class of surfactants, i.e., those surfactants having ionophoric properties.

Nitzan teaches the use of polycationic agent polymyxin nonapeptide (PMNP) and the photosensitizer deuteroporphyrin (DP) to eradicate the gram negative bacteria E Coli and Pseudomonas aerugenosa. Nitzan uses the PMNP to bind the DP so that the PMNP-DP complex will bind to the cell membrane, much as a membrane specific antibody would. Neither PMNP or the PMNP-DP complex cause a disruption of the cell membrane (pp 94 1st column). PMNP is not an ionophoric surfactant and this accounts for the limited destruction of the gram negative bacteria treated, with 10^3 bacteria surviving after 3 hours of light illumination. The absence of PMNP's ionophoric properties is also disclosed by Rothstein (col 14, Table I), as compared to polymyxin B and SDS, which are ionophoric surfactants. Unlike the present invention, Nitzan teaches the use of nonionophoric surfactants to assist in the binding of the photosensitizer to the cell membrane. Nitzan in fact teaches away from the concept of using photosensitizers and ionophoric surfactants to increase the cell membrane permeability and allow the photosensitizer to enter the cell by diffusion as is disclosed in the present invention.

Claim Rejection: 35 U.S.C. §103 – Lyons and Nitzan

Claims 19, 20, 21, 92, 94, 95 and 99-102 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lyons in combination with Nitzan et al.

Independent claims 10 and 92 have been amended to more clearly define the Applicant's invention. As a result, claims 19, 20, 21, 92, 94, 95 and 99-102 are believed patentable in view of the prior art of record. Reconsideration of the rejections of claim 19, 20, 21, 92, 94, 95 and 99-102 is solicited.

In the latest Office action, it was stated that

> "Lyons teaches a treatment arrangement such as claimed except for the particular surfactant, the particular sensitizer and the plurality of sensitizers. Nitzan et al teach a composition such as claimed as claimed except for the use of SDS, an amphoteric surfactant, methylene blue, and a mixture of photosensitizers. It would have been obvious to the artisan of ordinary skill to employ polymyxin B or SDS and the claimed concentrations thereof in the solution of Lyons since these are notorious surfactants in the art, official notice of which is hereby taken, to employ methylene blue, since this is notorious as a photosensitizer in the art, official notice of which is hereby taken and to employ a mixture of photosensitizers, since this would allow treatment of multiple conditions simultaneously and provides no unexpected result, thus producing a kit and solution such as claimed." Paragraph 8, Pages 3-4.

It is respectfully submitted that Lyons does not teach a treatment arrangement such as claimed except for the particular surfactant, the particular photosensitizer and the plurality of sensitizers. As discussed in more detail above with reference to the Section 102 rejections, Lyons discloses surfactants as emulsifying agents to enhance solubility of the drug (col 10 line 21+). Unlike the present invention, Lyons utilizes surfactants as emulsifying agents, not as ionophoric agents to increase cell membrane permeability to allow the photosensitizer to diffuse into the cells. In contrast to Lyons, independent claims 10 and 92 of the present invention are directed to a photodynamic therapy using a combined application of a photosensitizing agent and a particular class of surfactants, namely those surfactants having ionophoric properties. Upon application of a light source, the photosensitizing agent is activated within the cell interior and

results in an internal photodynamic destruction of the cell. Lyons does not teach or suggest the passage of a photosensitizing agent within the cell interior for subsequent activation.

Importantly, Lyons does not teach or suggest that alternative surfactants having ionophoric properties be substituted for the surfactants disclosed therein. Lyons discloses the use of surfactants to improve compound solubility by micellar formation. As a result, Lyons specifically teaches away from the use of surfactants having ionophoric properties as by definition and function surfactants having ionophoric properties behave differently than other surfactants or surfactant concentrations, particularly those surfactants having micelle formation properties.

Nitzan et al does not disclose, teach, or suggest the use of surfactants having ionophoric properties. PNMP is not an ionphoric surfactant. Unlike the present invention, Nitzan teaches the use of nonionophoric surfactants to assist in the binding of the photosensitizer to the cell membrane. Nitzan in fact teaches away from the concept of using photosensitizers and ionophoric surfactants to increase the cell membrane permeability and allow the photosensitizer to enter the cell by diffusion as is disclosed in the present invention.

There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the art would make the combination to achieve the subject matter of the present claims. *See*, Symbol Technologies, Inc. v. Opticon Inc., 935 F.2d 1569, 19 USPQ2d 1241 (Fed. Cir. 1991). Since no such reason, suggestion or motivation exists, the pending claims are not obvious in view of the known prior art.

Even assuming that the combination of Lyons and Nitzan as proposed in the previous office action was correct, the combination of references would fail to disclose or teach the invention as presently claimed, i.e., the use of a surfactant having ionophoric properties in combination with a photosensitizing agent in a photodynamic therapy, wherein the surfactant compromises the cell membrane to permit diffusion of the photosensitizing agent into the cell interior and subsequent photodynamic illumination of the photosensitizing agent within the cell interior to cause cellular destruction.

As a result, reconsideration of the rejection of claims 19, 20, 21, 92, 94, 95 and 99-102 is solicited.

Claim Rejection: 35 U.S.C. §103 – Lyons and Nitzan

Claims 10, 16, 17, 26, 29-33, 35, 36, 47, 49, 53, 60, 64-66, and 72-80 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lyons in combination with Nitzan et al.

Independent claims 10, 26, 49, 60, and 72 have been amended to more clearly define the Applicant's invention. As a result, claims 10, 16, 17, 26, 29-33, 35, 36, 47, 49, 53, 60, 64-66, and 72-80 are believed patentable in view of the prior art of record. Reconsideration of the rejections of claim 10, 16, 17, 26, 29-33, 35, 36, 47, 49, 53, 60, 64-66, and 72-80 is solicited.

In the latest Office action, it was stated that

> "The teachings of Lyons and Nitzan, et al., and the motivations for combination and modification thereof, and the official notice are essentially those already interated in the rejection of claims 9, 20, 21, 92, 94, 95 and 99-102 above. Additionally performing the methods as part of a sterilization procedure, in conjunction with an infected wound, or with gram positive bacteria would have been obvious, since it is effective against drug resistant bacteria; would be useful in the case of, for example, an ulcerated bowel tumor; and the presence of gram positive infectious agents, respectively, thus producing a method such as claimed." Paragraph 9, Page 4.

In view of the remarks made in reference to the above rejection of claims, reconsideration of the rejection of claims 10, 16, 17, 26, 29-33, 35, 36, 47, 49, 53, 60, 64-66, and 72-80 is solicited.

Separately, a prima facie case of obviousness of claims 53 and 66 is not supported by the combination of Lyons and Nitzan et al. The particular SDS concentration of between 0.003% and 0.01% of claims 53 and 66 is not taught by Lyons and Nitzan et al. Unlike the present invention, Nitzan teaches the use of nonionophoric surfactants to assist in the binding of the photosensitizer to the cell membrane. Nitzan in fact teaches away from the concept of using photosensitizers and ionophoric surfactants to increase the cell membrane permeability and allow

the photosensitizer to enter the cell by diffusion as is disclosed in the present invention. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the art would make the combination to achieve the subject matter of the present claims. *See*, Symbol Technologies, Inc. v. Opticon Inc., 935 F.2d 1569, 19 USPQ2d 1241 (Fed. Cir. 1991). Since no such reason, suggestion or motivation exists, the pending claims are not obvious in view of the known prior art.

As a result, reconsideration of the rejection of these claims is solicited.

Claim Rejection: 35 U.S.C. §103 – Swartz et al and Asculai et al.

Claims 54, 55, and 57-59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Swartz et al in combination with Asculai et al.

Independent claim 54 have been amended to more clearly define the Applicant's invention. As a result, claims 54, 55, and 57-59 are believed patentable in view of the prior art of record. Reconsideration of the rejections of claim 54, 55, and 57-59 is solicited.

In the latest Office action, it was stated that

> "Swartz, et al. teaches a method such as claimed except for the use of a surfactant. Asculai, et al. teaches the use of surfactants to inactive viruses. It would have been obvious to the artisan of ordinary skill to employ a surfactant in the method of Swartz, et al. since this would further inactivate the virus and would help adjust the properties of the gel official notice of which is hereby taken, to employ SDS, since this is a notorious non ionic surfactant in the art, official notice of which is hereby taken and to employ a concentration in the claimed range, since this provides no unexpected result, thus producing a method such as claimed." Paragraph 10, Pages 4-5.

Applicant respectfully submits that in view of the remarks made in reference to the above rejection of claims, reconsideration of the rejection of claims 54, 55, and 57-59 is solicited.

Swartz et al. discloses the use of methylene blue, light and electricity to eradicate viruses and cells. However, Swartz et al. demonstrates that methylene blue and light alone does not cause a significant reduction in Herpes Simplex Virus (Fig 6, page 5). Only by the addition of an electric field is a significant reduction in the virus population achieved. Swatz et al. confirms that methylene blue and light alone do no eradicate viruses. In comparison, an embodiment of the present invention provides for effective antiviral eradication utilizing the combination of methylene blue, an ionophoric surfactants and light illumination.

Additionally, Swartz et al does not teach or suggest that any surfactant be combined with methylene blue in a photodynamic therapy. Furthermore, Swartz et al does not disclose that a particular type of surfactant having ionophoric properties be used as presently claimed. Swartz et al does not suggest, teach, or disclose that surfactants, particularly ionophoric surfactants, be utilized in combination with a photosensitizing agent in a photodynamic therapy. Even assuming that the combination of Swartz et al and Asculai et al as proposed in the previous office action was correct, the combination of references would fail to disclose or teach the invention as presently claimed, i.e., the use of a surfactant having ionophoric properties in combination with a photosensitizing agent in a photodynamic therapy, wherein the surfactant compromises the cell membrane to permit diffusion of the photosensitizing agent into the cell interior and subsequent photodynamic illumination of the photosensitizing agent within the cell interior to cause cellular destruction.

There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the art would make the combination to achieve the subject matter of the present claims. *See*, Symbol Technologies, Inc. v. Opticon Inc., 935 F.2d 1569, 19 USPQ2d 1241 (Fed. Cir. 1991). Since no such reason, suggestion or motivation exists, the pending claims are not obvious in view of the known prior art.

Separately, a prima facie case of obviousness of claim 58 is not supported by the combination of Swartz et al with Asculai et al. The particular SDS concentration of between 0.003% and 0.01% of claim 58 is not taught by Swartz et al with Asculai et al.

As a result, reconsideration of the rejection of claims 54, 55, and 57-59 is solicited.

Claim Rejection: 35 U.S.C. §103 – Swartz et al and Asculai et al. and Nitzan et al.

Claim 56 were rejected under 35 U.S.C. §103(a) as being unpatentable over Swartz, et al., in combination with Asculai, et al., as applied to claim 55 above, and further in view of Nitzan, et al.

Independent claim 54 has been amended to more clearly define the Applicant's invention. As a result, claim 56 is believed patentable in view of the prior art of record. Reconsideration of the rejection of claim 56 is solicited.

In the latest Office action, it was stated that

> "Nitzan, et al. teach the irradiation dosage and dosage rates claimed. It would have been obvious to the artisan of ordinary skill to employ the dosage and dosage rates taught by Nitzan, et al., since these are appropriate for causing DNA alterations and thus inactivation, as taught by Nitzan, et al., and since these are determinable by routine experimentation and provides no unexpected results, thus producing a method such as claimed. Paragraph 11, Page 5.

In view of the remarks made in reference to the above rejection of claims, reconsideration of the rejection of claim 56 is solicited.

Claim Rejection: Double Patenting

Claims 1-102 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,251,127 in view of Rothstein. A terminal disclaimer in compliance with 37 CFR 1.130(b) is included with this response.

Applicant respectfully requests that the Examiner consider the pending claims and issue a Notice of Allowance thereon.

Please direct any questions regarding this application to John Klos at (612) 321-2806.

Respectfully submitted,
Merrill A. Biel, by his attorneys

By: _____

John F. Klos, Esq.
Registration No. 37,162
Fulbright & Jaworski L.L.P.
225 South Sixth Street, #4850
Minneapolis, MN 55402-4320
Telephone: (612) 321-2806

Dated: April 22, 2002

CERTIFICATE OF MAILING UNDER 37 C.F.R. 1.8: I hereby certify that this paper and any papers referred to herein are being deposited with the U.S. Postal service, as first class mail, postage prepaid, addressed to Commissioner for Patents, Washington, D.C. 20231 on April 22, 2002. John F. Klos: _____

(Marked-Up Version Showing Application as Amended 4/22/2002)

In the Claims:

1. (amended) A method of photoeradication of cells comprising the steps of:

identifying an area of cell activity;

applying a concentration including a combination of a surfactant and a photosensitizing agent to the area of cell activity, said surfactant having ionophoric properties and producing a disorientation of a cell membrane so that said cell membrane no longer functions as an effective osmotic barrier, thereby allowing the photosensitizing agent to pass through the cell membrane and into the cell interior; and

exposing the area of cell activity to a light having a light wavelength, light dosage and a light dosage rate, thereby activating the photosensitizing agent within the cell interior to cause internal photodynamic cell destruction.

9. (amended) A photodynamic therapy treatment kit comprising:

a volume of a concentration including a combination of a surfactant having ionophoric properties and a photosensitizing agent, said surfactant producing a disorientation of a cell membrane so that said cell membrane no longer functions as an effective osmotic barrier, thereby permitting the photosensitizing agent to pass into the cell interior and

a light emitting treatment device configured to emit light and to activate photosensitizing agent within the cell interior to cause internal photodynamic destruction of the cell.

10. (amended) A method of treatment comprising:

[providing] selecting one or more cells;

disposing a concentration in proximity to the one or more cells, said concentration including a combination of a surfactant having ionophoric properties and a photosensitizing agent on the one or more cells, said surfactant disorienting a cell membrane[,] so that said cell membrane no longer functions as an effective osmotic barrier, thereby permitting the photosensitizing agent to pass into the one or more cells; and

applying a light in proximity to the one or more cells, wherein the combination of the light and [the surfactant and the] photosensitizing agent within the one or more cells causes internal photodynamic disruption of the one or more cells.

13. (amended) The method of treatment of claim 10 wherein the one or more cells are gram positive [or gram negative].

16. (amended) The method of treatment of claim 10 wherein the step of [providing] selecting one or more cells is [associated with a sterilization procedure] achieved by selecting a sterilization field.

17. (amended) The method of treatment of claim 10 wherein the step of [providing] selecting one or more cells is [associated with treatment of an infection at a tissue site] achieved by selecting an infection tissue site.

18. (amended) The method of treatment of claim 10 wherein the step of applying the light in proximity to the one or more cells results in photodynamic-induced cell death.

22. (amended) The treatment kit according to claim 9 wherein the light emitting treatment device [is configured to emit] emits light at wavelengths ranging from [about] approximately 450nm to [about] approximately 850nm; and [to provide] provides a dosage rate ranging from [about] approximately 0 to [about] approximately 150 [mw/cm2] mw/cm^2 and a light dose ranging from [about] approximately 0 to [about] approximately 300 [J/cm2] J/cm^2.

23. (amended) The method of treatment according to claim 10 wherein the combination includes a photosensitizing agent and more than one surfactant having ionophoric properties.

24. (amended) The method of treatment according to claim 10 wherein the combination includes a surfactant having ionophoric properties and more than one photosensitizing agent.

25. (amended) The method of treatment according to claim 10 wherein the combination includes [more than one surfactant and more than one photosensitizing agent] a plurality of different surfactants each having ionophoric properties and a plurality of different photosensitizing agents.

26. (amended) A method of cell disruption comprising:

[providing] selecting one or more cells;

disposing a photosensitizing agent in proximity to the one or more cells;

disposing a surface acting agent in proximity to the one or more cells, said surface acting agent having ionophoric properties and disorienting a cell membrane so that said cell membrane no longer functions as an effective osmotic barrier, whereby the photosensitizing agent passes through the cell membrane;

[disposing a photosensitizing agent in proximity to the one or more cells;] and

applying a light in proximity to the one or more cells to cause internal photodynamic cellular disruption of the one or more cells.

35. (amended) The method of cell disruption of claim 26 wherein the step of [providing] selecting one or more cells is associated with a sterilization procedure.

36. (amended) The method of cell disruption of claim 26 wherein the step of [providing] selecting one or more cells is associated with a treatment of an infection at a tissue site.

37. (amended) The method of cell disruption of claim 26 wherein the step of [providing] selecting one or more cells includes providing one or more of a microbe or a fungus or a cancer cell.

38. (amended) The method of cell disruption of claim 26 wherein the surface acting agent is an anionic surfactant having ionophoric properties.

39. (amended) The method of cell disruption of claim 26 wherein the surface acting agent is a cationic surfactant having ionophoric properties.

40. (amended) The method of cell disruption of claim 26 wherein the surface acting agent is a non-ionic surfactant having ionophoric properties.

41. (amended) The method of cell disruption of claim 26 wherein the surface acting agent is an amphoteric surfactant having ionophoric properties.

42. (amended) The method of cell disruption of claim 38 wherein the surface acting agent is SDS at a concentration having ionophoric properties.

43. (amended) The method of cell disruption of claim 39 wherein the surface acting agent is polymyxin B at a concentration having ionophoric properties.

44. (amended) The method of cell disruption of claim 26 wherein the step of applying light results in photodynamic cell destruction.

45. (amended) The method of cell disruption of claim 26 wherein the step of selecting one or more cells is achieved by selecting gram negative bacteria, and wherein the step of disposing a surface acting agent results in an increase in [only] gram negative bacterial cell membrane permeability.

46. (amended) The method of cell disruption of claim 26 wherein the step of selecting one or more cells is achieved by providing gram positive bacteria, and wherein the step of disposing a surface acting agent results in an increase in [only] gram positive bacterial cell membrane permeability.

47. (amended) The method of cell disruption of claim 26 wherein the step of [providing] selecting one or more cells includes the step of [providing] selecting a plurality of gram

negative bacteria cells and a plurality of gram positive bacteria cells, and the step of disposing a surface acting agent results in an increase in both gram negative bacterial and gram positive bacterial cell membrane permeability.

48. (amended) The method of cell disruption of claim 26 wherein the step of [providing] selecting one or more cells includes the step of [providing] selecting a plurality of cells from among a gram negative bacteria cell, a gram positive bacteria cell, a fungal cell, and a tissue cell, and the step of disposing a surface acting agent results in an increase in cell membrane permeability of the plurality of cells.

49. (amended) A method of photodynamic disruption of cells comprising the steps of:

identifying an area of cell activity;

applying a concentration including a combination of a surfactant having ionophoric properties and a photosensitizing agent to the area of cell activity, said surfactant disorienting a cell membrane so that said membrane no longer functions as an effective osmotic barrier, and so that said photosensitizing agent is able to pass through [the] a disoriented cell membrane and into a cell interior; and

exposing the area of cell activity to light having a light wavelength, light dosage and a light dosage rate to activate the photosensitizing agent within the cell interior to cause internal photodynamic cellular disruption.

54. (amended) A method of photodynamic disruption of acellular organisms comprising the steps of:

identifying an area of acellular organism activity;

applying a concentration including a combination of a surfactant having ionophoric properties and a photosensitizing agent to the area of acellular organism activity, said surfactant disorienting an acellular organism membrane so that said membrane no longer functions as an effective osmotic barrier, and so that said photosensitizing agent is able to

pass through [the] a disoriented acellular organism membrane and into the acellular organism interior; and

exposing the area of acellular organism activity to light having a light wavelength, light dosage and a light dosage rate to activate photosensitizing agent within the acellular organism interior to cause an internal photodynamic destruction of the acellular organism.

60. (amended) A treatment protocol for a living body having cancer cells, said protocol comprising the steps of:

identifying cancer cells within the living body;

selecting a chemical agent having ionophoric properties to disrupt a membrane of the cancer cells;

administering the chemical agent to the living body, said chemical agent disorienting a cancer cell membrane so that said membrane no longer functions as an effective osmotic barrier;

administering a photosensitizing agent to the living body, said photosensitizing agent passing through the cancer cell membrane; and

applying a light in proximity to the cancer cells, the combination of photosensitizing agent within the cell interior and light resulting in internal photodynamic disruption of the cancer cells.

61. (amended) The treatment protocol according to claim 60 wherein the chemical agent is an anionic surfactant having ionophoric properties.

62. (amended) The treatment protocol according to claim 60 wherein the chemical agent is a cationic surfactant having ionophoric properties.

63. (amended) The treatment protocol according to claim 60 wherein the chemical agent is a nonionic surfactant having ionophoric properties.

64. (amended) The treatment protocol according to claim 60 wherein the chemical agent is an amphoteric surfactant having ionophoric properties.

65. (amended) The treatment protocol according to claim 61 wherein the chemical agent is SDS at a concentration having ionophoric properties.

72. (amended). A treatment protocol for a living body having microbial cells, said protocol comprising the steps of:

identifying microbial cells within the living body;

selecting a chemical agent having ionophoric properties to disorient a cell membrane of [the] a microbial cell within the microbial cells so that said cell membrane no longer functions as an effective osmotic barrier;

administering the chemical agent to the living body;

administering a photosensitizing agent to the living body, said photosensitizing agent passing through the cell membrane and into the interior of the microbial cell; and

applying a light in proximity to the microbial [cells] cell, said light in combination with the photosensitizing agent within the microbial cell to cause internal photodynamic disruption of the microbial [cells] cell.

73. (amended) The treatment protocol according to claim 72 wherein the chemical agent is an anionic surfactant having ionophoric properties.

74. (amended) The treatment protocol according to claim 72 wherein the chemical agent is a cationic surfactant having ionophoric properties.

75. (amended) The treatment protocol according to claim 72 wherein the chemical agent is a nonionic surfactant having ionophoric properties.

76. (amended) The treatment protocol according to claim 72 wherein the chemical agent is an amphoteric surfactant having ionophoric properties.

77. (amended) The treatment protocol according to claim 73 wherein the chemical agent is SDS at a concentration having ionophoric properties.

78. (amended) The treatment protocol according to claim 74 wherein the chemical agent is polymyxin B at a concentration having ionophoric properties.

80. (amended) The treatment protocol of claim [72] 79 wherein the step of disposing the solution on at least a portion of the [human] living body includes a solution administration selected from among a group of: topical administration, intravenous administration, subcutaneous administration, administration proximate the microbial cells, and administration within the microbial cells.

81. (amended) A method of cell disruption comprising:

providing a plurality of cells;

disposing a surface acting agent having ionophoric properties in proximity to the plurality of cells, said surface acting agent disrupting a cell membrane so that said membrane no longer functions as an effective osmotic barrier;

disposing a photosensitizing agent in proximity to the plurality of cells, said photosensitizing agent passing through the cell membrane and into the cell interior; and

applying a light in proximity to the one or more cells to [cause] activate photosensitizing agent within the cell interior to cause internal photodynamic disruption of the plurality of cells.

84. (amended) The method of cell disruption of claim 81 wherein the surface acting agent is SDS at a concentration having ionophoric properties.

85. (amended) The method of cell disruption of claim 81 wherein the surface acting agent is polymyxin B at a concentration having ionophoric properties.

87. (amended) A method of potentiation of photodynamic therapy of a plurality of cells, said method comprising the steps of:

administering a surface acting agent having ionophoric properties in proximity to the plurality of cells, said surface acting agent causing a disorientation in a cell membrane so that said cell membrane no longer functions as an effective osmotic barrier;

administering a photosensitizing agent in proximity to the plurality of cells, said photosensitizing agent passing through the cell membrane and into the cell interior; and

applying a light in proximity to the plurality of cells, said light in combination with the photosensitizing agent causing activation of photosensitizing agent within the cell interior and internal photodynamic disruption of the plurality of cells.

92. (amended) A kit for potentiation of a photodynamic therapy of a pathogenic cell [sitbe] site, said photodynamic therapy utilizing a light source for a photodynamic cellular disruption at the pathogenic cell site, said kit comprising:

a surface acting agent having ionophoric properties and suitable for use [adapted to be disposed] in proximity to the pathogenic cell site, said surface acting agent [adapted to disrupt] disrupting a pathogenic cell membrane so that said membrane no longer functions as an effective osmotic barrier; and

a photosensitizing agent [adapted to be disposed] suitable for use in proximity to the pathogen cell site and passing within the pathogenic cell membrane and reactive with the light source to result in [the] an internal photodynamic cellular disruption.

95. (amended) A combined solution for potentiation of a photodynamic therapy of a pathogenic cell site, said photodynamic therapy utilizing a light source for a photodynamic cellular disruption at the pathogenic cell site, said combined solution adapted to be disposed in proximity to the pathogen cell site, said solution comprising:

a surface acting agent having ionophoric properties, said surface acting agent adapted to disorientate a pathogenic cell membrane so that said membrane no longer functions as an effective osmotic barrier; and

a photosensitizing agent, said photosensitizing agent being passed through the pathogenic cell membrane, [at least a portion of said solution] said photosensitizing agent being reactive with the light source to result in [the] an internal photodynamic cellular disruption of the pathogenic cell site.